THE UNIVERSITY OF KANSAS SPACE TECHNOLOGY LABORATORIES
2291 Irving Hill Dr.— Campus West Lawrence, Kansas 66044
Telephone:

August 24, 1973

Mr. Timothy White, Code TD4
Technical Monitor
NASA L. B. Johnson Space Center
Houston, Texas 77058

Dear Mr. White:

The University of Kansas Center for Research, Inc., reports the following work preformed during the period 1 July 1973 - 31 July 1973, under Contract NAS 9-13331.

1.0 CONTINUING STUDIES

1.1 (Tasks 2.1.1.2, 2.1.3.1, 2.1.3.2) Development of Back-Scattering Catalog

Work on preparing a comprehensive catalog of back-scatter measurements continued. For comparison between results by two sensors (investigations) the graphs for σ^o vs θ for a category were normalized so that only a ratio of the value of σ^o at an angle to the value at which the σ^o was considered unity was the criterion for comparison. The scatter of measurement values of a single category is still substantial. The measurements reported by many investigators have a mean value and a bound about this value; while the mean values (assumed to be in the middle of the bound) are separable, the bounds of two categories still overlap.

The comparisons of σ^o from different investigations and categories are being made in three ways:

(1) Original data.
(2) Data normalized to one look angle
(3) Data normalized to one terrain category.

1.2 (Tasks 2.1.1.2, 2.1.3.1, 2.1.3.2) Development of Brightness Temperature Catalogue

This effort is continuing at the same pace as the one mentioned above. There is a further problem to be resolved in the case of radiometric measurements. The return from terrain is so dependent upon moisture that this variable can cause the return from one category to appear as if from another. This problem compounds the classification of radiometric return into categories. The problem is being studied.

1.3 (Task 2.1.3.3) Atmospheric Effects on S193 RadScat

A model for the absorption due to oxygen and water vapor has been decided upon. A study is under way to determine the errors introduced in S193 Radscat measurements by assuming a standard profile for the atmosphere rather than actual

radiosonde soundings. It seems at this point that a few appropriate standard profiles (in most cases) would cause an error within the resolution of the radiometer. For the scatterometer the errors introduced (in clear sky cases) are almost negligible. Models for clouds and various precipitation models have been incorporated in the study to determine their effects upon the radiometer and scatterometer.

1.4 (Task 2.1.2.1) Operation of S193 RadScat while SKYLAB is in Solar Pointing Mode

This analysis is now complete in its mathematical treatment. It is being revised to be more compatible with the coordinate systems and other definitions used by flight planning personnel at NASA.

1.5 (Task 2.1.1.5) Ground Truth Collection

This effort, started last month, is proceeding at a satisfactory pace. Topographic maps (1:250,000) have been received and the flight paths plotted on them. Land use classification will be more elaborate when S190A photographs are received. The severe weather-forecasting station in Kansas City seems to be a very capable and cooperative source of providing metereological data for any point in the country close to S193 data-takes.

1.6 (Task 2.1.1.4) Data Decommutation

The listing of data-takes received has been put on tape for processing. The targets on the ground (approximate location) at 15 second intervals were computed and were used as input for plotting flight lines on the topographic maps. A routine to convert data in NASA's - Non Imagery Format to our system standard format have been written and debugged.

2.0 SPECIAL ANALYSES

None Required.

3.0 DATA RECEIVED

A sheet listing the times of S193 data takes (showing instrument, mode and polarization) for this project were received.

4.0 REPORTS COMPLETED

No reports were completed during this time period.

Sincerely,

Arun Sobti
Senior Research Engineer

AS/rb